

CLAIMS

What is claimed is:

1 ~~1. A method comprising:~~
2 configuring a circuit emulation service (CES) over an internet protocol (IP) network
3 based on properties of the IP network, the CES being configured from a local interworking
4 function to a remote interworking function;
5 encapsulating data received at a constant bit rate at the local interworking function into a
6 plurality of IP packets configured according to the CES; and
7 transporting the IP packets from the local interworking function to the remote
8 interworking function according to the CES.

1 2. The method of claim 1 wherein the properties of the IP network comprise at least one of a
2 maximum delay variation, a bit error rate, out-of-order IP packet delivery, and an unpredictable
3 packet loss rate.

1 ~~3. The method of claim 1 wherein configuring the CES comprises establishing a tunnel to carry~~
2 the plurality of IP packets between the local and remote interworking functions.

1 4. The method of claim 3 wherein the tunnel comprises a layer 2 tunneling protocol (L2TP)
2 tunnel and L2TP tunnel session within the L2TP tunnel.

1 5. The method of claim 3 wherein the tunnel comprises a multi-protocol label-switching (MPLS)
2 tunnel.

1 6. The method of claim 1 wherein configuring the CES comprises:

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"Express Mail" mailing label number

2 exchanging a plurality of CES control protocol (CESCP) information between the local
3 interworking function and the remote interworking function.

1 7. The method of claim 6 wherein the plurality CESCP information comprises at least one of a
2 circuit identification and an internet protocol address for the local and remote interworking
3 functions, alarm indication signal options, idle condition options, a clock option, a check sum
4 option, a minimum and a maximum circuit size, a multiple circuits option, a maximum transition
5 delay, a maximum delay variation, a compression option, and an encryption option.

1 8. The method of claim 1 wherein encapsulating the data comprises attaching a CES header to
2 each IP packet.

1 9. The method of claim 8 wherein the CES header comprises a version number for compatibility
2 between the local interworking function and the remote interworking function.

1 10. The method of claim 1 further comprising:
2 buffering a plurality of IP packets received from the remote interworking function for at
3 least as long as a maximum delay variation; and
4 outputting payloads of the plurality of received IP packets at the constant bit rate.

1 11. The method of claim 10 wherein the maximum delay variation comprises delay due to out-
2 of-order IP packet delivery.

1 12. The method of claim 1 wherein each IP packet further comprises at least one circuit, each
2 circuit comprising at least one circuit header.

3 13. The method of claim 12 wherein the at least one circuit header comprises at least one of a
4 circuit identification, a flag field, a sequence number, a first octet padding value, a last octet
5 padding value, and a data field.

1 14. The method of claim 13 wherein the flag field comprises at least one of a compression flag,
2 an idle flag, an alarm indication signal flag, and a clocking information flag.

1 15. The method of claim 14 wherein the clocking information flag comprises a synchronous
2 residual time stamp (SRTS) value.

2 16. The method of claim 13 wherein the sequence number indicates a starting position of a first
3 bit of data in the corresponding circuit with respect to a reference point in a corresponding bit
4 stream.

1 17. An article of manufacture comprising:
2 a machine readable storage medium having stored thereon a plurality machine executable
3 instructions; and
4 said instructions, when executed, to implement a method comprising
5 configuring a circuit emulation service (CES) over an internet protocol (IP)
6 network based on properties of the IP network, the CES being configured from a local
7 interworking function to a remote interworking function;
8 encapsulating data received at a constant bit rate at the local interworking function
9 into a plurality of IP packets configured according to the CES; and
10 transporting the IP packets from the local interworking function to the remote
11 interworking function according to the CES.

18. An apparatus comprising:

first circuitry to configure a circuit emulation service (CES) over an internet protocol (IP) network based on properties of the IP network, the CES being configured from a local interworking function to a remote interworking function;

second circuitry to encapsulate data received at a constant bit rate at the local interworking function into a plurality of IP packets configured according to the CES; and
third circuitry to transport the IP packets from the local interworking function to the remote interworking function according to the CES.

19. A method comprising:

configuring a circuit emulation service (CES) over an internet protocol (IP) network based on properties of the IP network, the CES being configured between a first interworking function to a second interworking function;

encapsulating data received at a constant bit rate at the first interworking function into a first plurality of IP packets configured according to the CES;

encapsulating data received at the constant bit rate at the second interworking function into a second plurality of IP packets configured according to the CES;

transporting the first plurality of IP packets from the first interworking function to the second interworking function according to the CES;

transporting the second plurality of IP packets from the second interworking function to the first interworking function according to the CES;

